

230 and 1,000 interrogations per second; or when Classes 1A and 2A ATCRBS Transponders, or Classes 1B, 2A, 3A, and 4 Mode S transponders are interrogated at a rate between 230 and 1,200 Mode 3/A interrogations per second:

(1) Verify that the transponder does not respond to more than 1 percent of ATCRBS interrogations when the amplitude of P_2 pulse is equal to the P_1 pulse.

(2) Verify that the transponder replies to at least 90 percent of ATCRBS interrogations when the amplitude of the P_2 pulse is 9 dB less than the P_1 pulse. If the test is conducted with a radiated test signal, the interrogation rate shall be 235 ± 5 interrogations per second unless a higher rate has been approved for the test equipment used at that location.

(c) Receiver Sensitivity:

(1) Verify that for any class of ATCRBS Transponder, the receiver minimum triggering level (MTL) of the system is -73 ± 4 dbm, or that for any class of Mode S transponder the receiver MTL for Mode S format (P6 type) interrogations is -74 ± 3 dbm by use of a test set either:

(i) Connected to the antenna end of the transmission line;

(ii) Connected to the antenna terminal of the transponder with a correction for transmission line loss; or

(iii) Utilized radiated signal.

(2) Verify that the difference in Mode 3/A and Mode C receiver sensitivity does not exceed 1 db for either any class of ATCRBS transponder or any class of Mode S transponder.

(d) Radio Frequency (RF) Peak Output Power:

(1) Verify that the transponder RF output power is within specifications for the class of transponder. Use the same conditions as described in (c)(1)(i), (ii), and (iii) above.

(i) For Class 1A and 2A ATCRBS transponders, verify that the minimum RF peak output power is at least 21.0 dbw (125 watts).

(ii) For Class 1B and 2B ATCRBS Transponders, verify that the minimum RF peak output power is at least 18.5 dbw (70 watts).

(iii) For Class 1A, 2A, 3A, and 4 and those Class 1B, 2B, and 3B Mode S transponders that include the optional high RF peak output power, verify that the minimum RF peak output power is at least 21.0 dbw (125 watts).

(iv) For Classes 1B, 2B, and 3B Mode S transponders, verify that the minimum RF peak output power is at least 18.5 dbw (70 watts).

(v) For any class of ATCRBS or any class of Mode S transponders, verify that the maximum RF peak output power does not exceed 27.0 dbw (500 watts).

NOTE: The tests in (e) through (j) apply only to Mode S transponders.

(e) Mode S Diversity Transmission Channel Isolation: For any class of Mode S trans-

ponder that incorporates diversity operation, verify that the RF peak output power transmitted from the selected antenna exceeds the power transmitted from the nonselected antenna by at least 20 db.

(f) Mode S Address: Interrogate the Mode S transponder and verify that it replies only to its assigned address. Use the correct address and at least two incorrect addresses. The interrogations should be made at a nominal rate of 50 interrogations per second.

(g) Mode S Formats: Interrogate the Mode S transponder with uplink formats (UF) for which it is equipped and verify that the replies are made in the correct format. Use the surveillance formats UF=4 and 5. Verify that the altitude reported in the replies to UF=4 are the same as that reported in a valid ATCRBS Mode C reply. Verify that the identity reported in the replies to UF=5 are the same as that reported in a valid ATCRBS Mode 3/A reply. If the transponder is so equipped, use the communication formats UF=20, 21, and 24.

(h) Mode S All-Call Interrogations: Interrogate the Mode S transponder with the Mode S-only all-call format UF=11, and the ATCRBS/Mode S all-call formats (1.6 microsecond P_4 pulse) and verify that the correct address and capability are reported in the replies (downlink format DF=11).

(i) ATCRBS-Only All-Call Interrogation: Interrogate the Mode S transponder with the ATCRBS-only all-call interrogation (0.8 microsecond P_4 pulse) and verify that no reply is generated.

(j) Squitter: Verify that the Mode S transponder generates a correct squitter approximately once per second.

(k) Records: Comply with the provisions of §43.9 of this chapter as to content, form, and disposition of the records.

[Amdt. 43-26, 52 FR 3390, Feb. 3, 1987; 52 FR 6651, Mar. 4, 1987, as amended by Amdt. 43-31, 54 FR 34330, Aug. 18, 1989]

PART 45—IDENTIFICATION AND REGISTRATION MARKING

Subpart A—General

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Subpart B—Marking of Products and Articles

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Subpart C—Nationality and Registration Marks

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- 45.23 Display of marks; general.
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AUTHORITY: 49 U.S.C. 106(g), 40103, 44109, 40113–40114, 44101–44105, 44107–44108, 44110–44111, 44504, 44701, 44708–44709, 44711–44713, 44725, 45302–45303, 46104, 46304, 46306, 47122.

EFFECTIVE DATE NOTE: By FAA–2006–25877, 74 FR 53394, Oct. 16, 2009, the authority citation for part 45 was revised, effective Apr. 14, 2010. For the convenience of the user, the revised text is set forth as follows:

AUTHORITY: 49 U.S.C. 106(g), 40103, 40113–40114, 44101–44105, 44107–44111, 44504, 44701, 44708–44709, 44711–44713, 44725, 45302–45303, 46104, 46304, 46306, 47122.

SOURCE: Docket No. 2047, 29 FR 3223, Mar. 11, 1964, unless otherwise noted.

EFFECTIVE DATE NOTE: At 74 FR 53394, Oct. 16, 2009, Part 45 was amended by removing the word “Administrator” and the words “Administrator of the FAA” and adding in their place the word “FAA” wherever they appear; and removing the word “shall” and adding in its place the word “must” wherever it appears, effective Apr. 14, 2010.

Subpart A—General

§ 45.1 Applicability.

This part prescribes the requirements for—

- (a) Identification of aircraft, and identification of aircraft engines and propellers that are manufactured under the terms of a type or production certificate;
- (b) Identification of certain replacement and modified parts produced for installation on type certificated products; and
- (c) Nationality and registration marking of U.S. registered aircraft.

[Doc. No. 2047, 29 FR 3223, Mar. 11, 1964, as amended by Amdt. 45–3, 32 FR 188, Jan. 10, 1967]

EFFECTIVE DATE NOTE: By Amdt. 45–26, 74 FR 53394, Oct. 16, 2009, § 45.1 was amended by revising paragraphs (a) and (b) and removing paragraph (c), effective Apr. 14, 2010. For the

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convenience of the user, the revised text is set forth as follows:

§ 45.1 Applicability.

* * * * *

(a) Marking products and articles manufactured under—

- (1) A type certificate;
- (2) A production approval as defined under part 21 of this chapter; and
- (3) The provisions of an agreement between the United States and another country or jurisdiction for the acceptance of products and articles; and

(b) Nationality and registration marking of U.S. registered aircraft.

Subpart B—Marking of Products and Articles

§ 45.10 Marking.

No person may mark a product or article in accordance with this subpart unless—

(a) That person produced the product or article —

(1) Under part 21, subpart F, G, K, or O of this chapter; or

(2) For export to the United States under the provisions of an agreement between the United States and another country or jurisdiction for the acceptance of products and articles; and

(b) That product or article conforms to its approved design, and is in a condition for safe operation; and, for a TSO article; that TSO article meets the applicable performance standards.

[Doc. No. FAA–2006–25877, 9274 FR 53394, Oct. 16, 2009]

EFFECTIVE DATE NOTE: By Doc. No. FAA–2006–25877, 74 FR 53394, Oct. 16, 2009, § 45.10 was added, effective Apr. 14, 2010.

§ 45.11 General.

(a) *Aircraft and aircraft engines.* Aircraft covered under § 21.182 of this chapter must be identified, and each person who manufactures an aircraft engine under a type or production certificate shall identify that engine, by means of a fireproof plate that has the information specified in § 45.13 of this part marked on it by etching, stamping, engraving, or other approved method of fireproof marking. The identification plate for aircraft must be secured in such a manner that it will not likely be defaced or removed during normal

service, or lost or destroyed in an accident. Except as provided in paragraphs (c), (d), and (e) of this section, the aircraft identification plate must be secured to the aircraft fuselage exterior so that it is legible to a person on the ground, and must be either adjacent to and aft of the rear-most entrance door or on the fuselage surface near the tail surfaces. For aircraft engines, the identification plate must be affixed to the engine at an accessible location in such a manner that it will not likely be defaced or removed during normal service, or lost or destroyed in an accident.

(b) *Propellers and propeller blades and hubs.* Each person who manufactures a propeller, propeller blade, or propeller hub under the terms of a type or production certificate shall identify his product by means of a plate, stamping, engraving, etching, or other approved method of fireproof identification that is placed on it on a noncritical surface, contains the information specified in § 45.13, and will not be likely to be defaced or removed during normal service or lost or destroyed in an accident.

(c) For manned free balloons, the identification plate prescribed in paragraph (a) of this section must be secured to the balloon envelope and must be located, if practicable, where it is legible to the operator when the balloon is inflated. In addition, the basket and heater assembly must be permanently and legibly marked with the manufacturer's name, part number (or equivalent) and serial number (or equivalent).

(d) On aircraft manufactured before March 7, 1988, the identification plate required by paragraph (a) of this section may be secured at an accessible exterior or interior location near an entrance, if the model designation and builder's serial number are also displayed on the aircraft fuselage exterior. The model designation and builder's serial number must be legible to a person on the ground and must be located either adjacent to and aft of the rear-most entrance door or on the fuselage near the tail surfaces. The model designation and builder's serial number must be displayed in such a manner that they are not likely to be defaced or removed during normal service.

(e) For powered parachutes and weight-shift-control aircraft, the identification plate prescribed in paragraph (a) of this section must be secured to the aircraft fuselage exterior so that it is legible to a person on the ground.

[Amdt. 45-3, 32 FR 188, Jan. 10, 1967 as amended by Amdt. 45-7, 33 FR 14402, Sept. 25, 1968; Amdt. 45-12, 45 FR 60183, Sept. 11, 1980; 45 FR 85597, Dec. 29, 1980; Amdt. 45-17, 52 FR 34101, Sept. 9, 1987; 52 FR 36566, Sept. 30, 1987; Amdt. 45-24, 69 FR 44863, July 27, 2004]

EFFECTIVE DATE NOTE: By Doc. No. FAA-2006-25877, 74 FR 53394, Oct. 16, 2009, § 45.11 was revised, effective Apr. 14, 2010. For the convenience of the user, the revised text is set forth as follows:

§ 45.11 Marking of products.

(a) *Aircraft.* A manufacturer of aircraft covered under § 21.182 of this chapter must mark each aircraft by attaching a fireproof identification plate that—

(1) Includes the information specified in § 45.13 using an approved method of fireproof marking;

(2) Must be secured in such a manner that it will not likely be defaced or removed during normal service, or lost or destroyed in an accident; and

(3) Except as provided in paragraphs (d) through (h) of this section, must be secured to the aircraft fuselage exterior so that it is legible to a person on the ground, and must be either adjacent to and aft of the rear-most entrance door or on the fuselage surface near the tail surfaces.

(b) *Aircraft engines.* A manufacturer of an aircraft engine produced under a type certificate or production certificate must mark each engine by attaching a fireproof identification plate. Such plate—

(1) Must include the information specified in § 45.13 using an approved method of fireproof marking;

(2) Must be affixed to the engine at an accessible location; and

(3) Must be secured in such a manner that it will not likely be defaced or removed during normal service, or lost or destroyed in an accident.

(c) *Propellers and propeller blades and hubs.* Each person who produces a propeller, propeller blade, or propeller hub under a type certificate or production certificate must mark each product or part using an approved fireproof method. The marking must—

(1) Be placed on a non-critical surface;

(2) Contain the information specified in § 45.13;

(3) Not likely be defaced or removed during normal service; and

(4) Not likely be lost or destroyed in an accident.

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(d) *Manned free balloons.* A manufacturer of manned free balloons must mark each balloon by attaching the identification plate described in paragraph (a) of this section. The plate must be secured to the balloon envelope and must be located, if practicable, where it is legible to the operator when the balloon is inflated. In addition, the basket and heater assembly must be permanently and legibly marked with the manufacturer's name, part number (or equivalent), and serial number (or equivalent).

(e) *Aircraft manufactured before March 7, 1988.* The owner or operator of an aircraft manufactured before March 7, 1988 must mark the aircraft by attaching the identification plate required by paragraph (a) of this section. The plate must be secured at an accessible exterior or interior location near an entrance, if the model designation and builder's serial number are also displayed on the exterior of the aircraft fuselage. The model designation and builder's serial number must be—

- (1) Legible to a person on the ground,
- (2) Located either adjacent to and aft of the rear-most entrance door or on the fuselage near the tail surfaces, and
- (3) Displayed in such a manner that they are not likely to be defaced or removed during normal service.

(f) For powered parachutes and weight-shift-control aircraft, the identification plate required by paragraph (a) of this section must be secured to the exterior of the aircraft fuselage so that it is legible to a person on the ground.

(g) The identification plate described in paragraph (a) of this section may be secured to the aircraft at an accessible location near an entrance for—

- (1) Aircraft produced for—
 - (i) Operations under part 121 of this chapter,
 - (ii) Commuter operations (as defined in § 119.3 of this chapter), or
 - (iii) Export.
- (2) Aircraft operating under part 121 of this chapter and under an FAA-approved continuous airworthiness maintenance program; or
- (3) Aircraft operating in commuter air carrier operations (as defined in § 119.3 of this chapter) under an FAA-approved continuous airworthiness maintenance program.

(h) *Gliders.* Paragraphs (a)(3) and (e) of this section do not apply to gliders.

§ 45.13 Identification data.

(a) The identification required by § 45.11 (a) and (b) shall include the following information:

- (1) Builder's name.
- (2) Model designation.
- (3) Builder's serial number.
- (4) Type certificate number, if any.

(5) Production certificate number, if any.

(6) For aircraft engines, the established rating.

(7) On or after January 1, 1984, for aircraft engines specified in part 34 of this chapter, the date of manufacture as defined in § 34.1 of that part, and a designation, approved by the Administrator of the FAA, that indicates compliance with the applicable exhaust emission provisions of part 34 and 40 CFR part 87. Approved designations include COMPLY, EXEMPT, and NON-US as appropriate.

(i) The designation COMPLY indicates that the engine is in compliance with all of the applicable exhaust emissions provisions of part 34. For any engine with a rated thrust in excess of 26.7 kilonewtons (6000 pounds) which is not used or intended for use in commercial operations and which is in compliance with the applicable provisions of part 34, but does not comply with the hydrocarbon emissions standard of § 34.21(d), the statement "May not be used as a commercial aircraft engine" must be noted in the permanent powerplant record that accompanies the engine at the time of manufacture of the engine.

(ii) The designation EXEMPT indicates that the engine has been granted an exemption pursuant to the applicable provision of § 34.7 (a)(1), (a)(4), (b), (c), or (d), and an indication of the type of exemption and the reason for the grant must be noted in the permanent powerplant record that accompanies the engine from the time of manufacture of the engine.

(iii) The designation NON-US indicates that the engine has been granted an exemption pursuant to § 34.7(a)(1), and the notation "This aircraft may not be operated within the United States", or an equivalent notation approved by the Administrator of the FAA, must be inserted in the aircraft logbook, or alternate equivalent document, at the time of installation of the engine.

(8) Any other information the Administrator finds appropriate.

(b) Except as provided in paragraph (d)(1) of this section, no person may remove, change, or place identification information required by paragraph (a)

of this section, on any aircraft, aircraft engine, propeller, propeller blade, or propeller hub, without the approval of the Administrator.

(c) Except as provided in paragraph (d)(2) of this section, no person may remove or install any identification plate required by § 45.11 of this part, without the approval of the Administrator.

(d) Persons performing work under the provisions of part 43 of this chapter may, in accordance with methods, techniques, and practices acceptable to the Administrator—

(1) Remove, change, or place the identification information required by paragraph (a) of this section on any aircraft, aircraft engine, propeller, propeller blade, or propeller hub; or

(2) Remove an identification plate required by § 45.11 when necessary during maintenance operations.

(e) No person may install an identification plate removed in accordance with paragraph (d)(2) of this section on any aircraft, aircraft engine, propeller, propeller blade, or propeller hub other than the one from which it was removed.

[Amdt. 45-3, 32 FR 188, Jan. 10, 1967, as amended by Amdt. 45-10, 44 FR 45379, Aug. 2, 1979; Amdt. 45-12, 45 FR 60183, Sept. 11, 1980; Amdt. 45-20, 55 FR 32861, Aug. 10, 1990; 55 FR 37287, Sept. 10, 1990]

EFFECTIVE DATE NOTE: By Amdt. 45-26, 74 FR 53395, Oct. 16, 2009, § 45.13 was amended by removing the text “and (b)” from paragraph (a) introductory text and adding in their place the text “through (c)” and by removing the words “of this part” from paragraph (c), effective Apr. 14, 2010.

§ 45.14 Identification of critical components.

Each person who produces a part for which a replacement time, inspection interval, or related procedure is specified in the Airworthiness Limitations section of a manufacturer's maintenance manual or Instructions for Continued Airworthiness shall permanently and legibly mark that component with a part number (or equivalent) and a serial number (or equivalent).

[Amdt. 45-16, 51 FR 40703, Nov. 7, 1986]

EFFECTIVE DATE NOTE: By Amdt. 45-26, 74 FR 53395, Oct. 16, 2009, § 45.14 was removed, effective Apr. 14, 2010.

§ 45.15 Replacement and modification parts.

(a) Except as provided in paragraph (b) of this section, each person who produces a replacement or modification part under a Parts Manufacturer Approval issued under § 21.303 of this chapter shall permanently and legibly mark the part with—

(1) The letters “FAA-PMA”;

(2) The name, trademark, or symbol of the holder of the Parts Manufacturer Approval;

(3) The part number; and

(4) The name and model designation of each type certificated product on which the part is eligible for installation.

(b) If the Administrator finds that a part is too small or that it is otherwise impractical to mark a part with any of the information required by paragraph (a) of this section, a tag attached to the part or its container must include the information that could not be marked on the part. If the marking required by paragraph (a)(4) of this section is so extensive that to mark it on a tag is impractical, the tag attached to the part or the container may refer to a specific readily available manual or catalog for part eligibility information.

[Amdt. 45-8, 37 FR 10660, May 26, 1972, as amended by Amdt. 45-14, 47 FR 13315, Mar. 29, 1982]

EFFECTIVE DATE NOTE: By Doc. No. FAA-2006-25877, 74 FR 53395, Oct. 16, 2009, § 45.15 was revised, effective Apr. 14, 2010. For the convenience of the user, the revised text is set forth as follows:

§ 45.15 Marking requirements for PMA articles, TSO articles, and Critical parts.

(a) *PMA articles.* The manufacturer of a PMA article must permanently and legibly mark—

(1) Each PMA article, with the PMA holder's name, trademark, symbol, or other FAA approved identification and part number; and

(2) The letters “FAA-PMA”.

(b) *TSO articles.* The manufacturer of a TSO article must permanently and legibly mark —

(1) Each TSO article with the TSO holder's name, trademark, symbol, or other FAA approved identification and part number; and

(2) Each TSO article, unless otherwise specified in the applicable TSO, with the TSO number and letter of designation, all

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markings specifically required by the applicable TSO, and the serial number or the date of manufacture of the article or both.

(c) *Critical parts.* Each person who manufactures a part for which a replacement time, inspection interval, or related procedure is specified in the Airworthiness Limitations section of a manufacturer's maintenance manual or Instructions for Continued Airworthiness must permanently and legibly mark that part with a serial number (or equivalent) unique to that part in addition to the other applicable requirements of this section.

(d) If the FAA finds a part or article is too small or otherwise impractical to mark with any of the information required by this part, the manufacturer must attach that information to the part or its container.

§ 45.16 Marking of life-limited parts.

When requested by a person required to comply with § 43.10 of this chapter, the holder of a type certificate or design approval for a life-limited part must provide marking instructions, or must state that the part cannot be practicably marked without compromising its integrity. Compliance with this paragraph may be made by providing marking instructions in readily available documents, such as the maintenance manual or the Instructions for Continued Airworthiness.

[Doc. No. FAA-200-8017, 67 FR 2110, Jan. 15, 2002]

EFFECTIVE DATE NOTE: By Amdt. 45-26, 74 FR 53395, Oct. 16, 2009, § 45.16 was amended by removing the last sentence of the section, effective Apr. 14, 2010.

Subpart C—Nationality and Registration Marks

§ 45.21 General.

(a) Except as provided in § 45.22, no person may operate a U.S.-registered aircraft unless that aircraft displays nationality and registration marks in accordance with the requirements of this section and §§ 45.23 through 45.33.

(b) Unless otherwise authorized by the Administrator, no person may place on any aircraft a design, mark, or symbol that modifies or confuses the nationality and registration marks.

(c) Aircraft nationality and registration marks must—

(1) Except as provided in paragraph (d) of this section, be painted on the

aircraft or affixed by any other means insuring a similar degree of permanence;

(2) Have no ornamentation;

(3) Contrast in color with the background; and

(4) Be legible.

(d) The aircraft nationality and registration marks may be affixed to an aircraft with readily removable material if—

(1) It is intended for immediate delivery to a foreign purchaser;

(2) It is bearing a temporary registration number; or

(3) It is marked temporarily to meet the requirements of § 45.22(c)(1) or § 45.29(h) of this part, or both.

[Doc. No. 8093, Amdt. 45-5, 33 FR 450, Jan 12, 1968, as amended by Amdt. 45-17, 52 FR 34102, Sept. 9, 1987]

§ 45.22 Exhibition, antique, and other aircraft: Special rules.

(a) When display of aircraft nationality and registration marks in accordance with §§ 45.21 and 45.23 through 45.33 would be inconsistent with exhibition of that aircraft, a U.S.-registered aircraft may be operated without displaying those marks anywhere on the aircraft if:

(1) It is operated for the purpose of exhibition, including a motion picture or television production, or an airshow;

(2) Except for practice and test flights necessary for exhibition purposes, it is operated only at the location of the exhibition, between the exhibition locations, and between those locations and the base of operations of the aircraft; and

(3) For each flight in the United States:

(i) It is operated with the prior approval of the Flight Standards District Office, in the case of a flight within the lateral boundaries of the surface areas of Class B, Class C, Class D, or Class E airspace designated for the takeoff airport, or within 4.4 nautical miles of that airport if it is within Class G airspace; or

(ii) It is operated under a flight plan filed under either § 91.153 or § 91.169 of this chapter describing the marks it displays, in the case of any other flight.

(b) A small U.S.-registered aircraft built at least 30 years ago or a U.S.-registered aircraft for which an experimental certificate has been issued under § 21.191(d) or 21.191(g) for operation as an exhibition aircraft or as an amateur-built aircraft and which has the same external configuration as an aircraft built at least 30 years ago may be operated without displaying marks in accordance with §§ 45.21 and 45.23 through 45.33 if:

(1) It displays in accordance with § 45.21(c) marks at least 2 inches high on each side of the fuselage or vertical tail surface consisting of the Roman capital letter “N” followed by:

(i) The U.S. registration number of the aircraft; or

(ii) The symbol appropriate to the airworthiness certificate of the aircraft (“C”, standard; “R”, restricted; “L”, limited; or “X”, experimental) followed by the U.S. registration number of the aircraft; and

(2) It displays no other mark that begins with the letter “N” anywhere on the aircraft, unless it is the same mark that is displayed under paragraph (b)(1) of this section.

(c) No person may operate an aircraft under paragraph (a) or (b) of this section—

(1) In an ADIZ or DEWIZ described in Part 99 of this chapter unless it temporarily bears marks in accordance with §§ 45.21 and 45.23 through 45.33;

(2) In a foreign country unless that country consents to that operation; or

(3) In any operation conducted under Part 121, 133, 135, or 137 of this chapter.

(d) If, due to the configuration of an aircraft, it is impossible for a person to mark it in accordance with §§ 45.21 and 45.23 through 45.33, he may apply to the Administrator for a different marking procedure.

[Doc. No. 8093, Amdt. 45-5, 33 FR 450, Jan. 12, 1968, as amended by Amdt. 45-13, 46 FR 48603, Oct. 1, 1981; Amdt. 45-19, 54 FR 39291, Sept. 25, 1989; Amdt. 45-18, 54 FR 34330, Aug. 18, 1989; Amdt. 45-21, 56 FR 65653, Dec. 17, 1991; Amdt. 45-22, 66 FR 21066, Apr. 27, 2001]

§ 45.23 Display of marks; general.

(a) Each operator of an aircraft shall display on that aircraft marks consisting of the Roman capital letter “N” (denoting United States registration)

followed by the registration number of the aircraft. Each suffix letter used in the marks displayed must also be a Roman capital letter.

(b) When marks include only the Roman capital letter “N” and the registration number is displayed on limited, restricted or light-sport category aircraft or experimental or provisionally certificated aircraft, the operator must also display on that aircraft near each entrance to the cabin, cockpit, or pilot station, in letters not less than 2 inches nor more than 6 inches high, the words “limited,” “restricted,” “light-sport,” “experimental,” or “provisional,” as applicable.

[Doc. No. 8093, Amdt. 45-5, 33 FR 450, Jan. 12, 1968, as amended by Amdt. 45-9, 42 FR 41102, Aug. 15, 1977; Amdt. 45-24, 69 FR 44863, July 27, 2004]

§ 45.25 Location of marks on fixed-wing aircraft.

(a) The operator of a fixed-wing aircraft shall display the required marks on either the vertical tail surfaces or the sides of the fuselage, except as provided in § 45.29(f).

(b) The marks required by paragraph (a) of this section shall be displayed as follows:

(1) If displayed on the vertical tail surfaces, horizontally on both surfaces, horizontally on both surfaces of a single vertical tail or on the outer surfaces of a multivertical tail. However, on aircraft on which marks at least 3 inches high may be displayed in accordance with § 45.29(b)(1), the marks may be displayed vertically on the vertical tail surfaces.

(2) If displayed on the fuselage surfaces, horizontally on both sides of the fuselage between the trailing edge of the wing and the leading edge of the horizontal stabilizer. However, if engine pods or other appurtenances are located in this area and are an integral part of the fuselage side surfaces, the operator may place the marks on those pods or appurtenances.

[Amdt. 45-9, 42 FR 41102, Aug. 15, 1977]

§ 45.27 Location of marks; nonfixed-wing aircraft.

(a) *Rotorcraft.* Each operator of a rotorcraft shall display on that rotorcraft horizontally on both surfaces of

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the cabin, fuselage, boom, or tail the marks required by § 45.23.

(b) *Airships.* Each operator of an airship shall display on that airship the marks required by § 45.23, horizontally on—

(1) The upper surface of the right horizontal stabilizer and on the under surface of the left horizontal stabilizer with the top of the marks toward the leading edge of each stabilizer; and

(2) Each side of the bottom half of the vertical stabilizer.

(c) *Spherical balloons.* Each operator of a spherical balloon shall display the marks required by § 45.23 in two places diametrically opposite and near the maximum horizontal circumference of that balloon.

(d) *Nonspherical balloons.* Each operator of a nonspherical balloon shall display the marks required by § 45.23 on each side of the balloon near its maximum cross section and immediately above either the rigging band or the points of attachment of the basket or cabin suspension cables.

(e) *Powered parachutes and weight-shift-control aircraft.* Each operator of a powered parachute or a weight-shift-control aircraft must display the marks required by §§ 45.23 and 45.29(b)(2) of this part. The marks must be displayed in two diametrically opposite positions on the fuselage, a structural member, or a component of the aircraft and must be visible from the side of the aircraft.

[Doc. No. 2047, 29 FR 3223, Mar. 11, 1964, as amended by Amdt. 45–15, 48 FR 11392, Mar. 17, 1983; Amdt. 45–24, 69 FR 44863, July 27, 2004; Amdt. 45–25, 72 FR 52469, Sept. 14, 2007]

§ 45.29 Size of marks.

(a) Except as provided in paragraph (f) of this section, each operator of an aircraft shall display marks on the aircraft meeting the size requirements of this section.

(b) *Height.* Except as provided in paragraph (h) of this part, the nationality and registration marks must be of equal height and on—

(1) Fixed-wing aircraft, must be at least 12 inches high, except that:

(i) An aircraft displaying marks at least 2 inches high before November 1, 1981 and an aircraft manufactured after November 2, 1981, but before January 1,

1983, may display those marks until the aircraft is repainted or the marks are repainted, restored, or changed;

(ii) Marks at least 3 inches high may be displayed on a glider;

(iii) Marks at least 3 inches high may be displayed on an aircraft for which the FAA has issued an experimental certificate under § 21.191 (d), § 21.191 (g), or § 21.191 (i) of this chapter to operate as an exhibition aircraft, an amateur-built aircraft, or a light-sport aircraft when the maximum cruising speed of the aircraft does not exceed 180 knots CAS; and

(iv) Marks may be displayed on an exhibition, antique, or other aircraft in accordance with § 45.22.

(2) Airships, spherical balloons, nonspherical balloons, powered parachutes, and weight-shift-control aircraft must be at least 3 inches high; and

(3) Rotorcraft, must be at least 12 inches high, except that rotorcraft displaying before April 18, 1983, marks required by § 45.29(b)(3) in effect on April 17, 1983, and rotorcraft manufactured on or after April 18, 1983, but before December 31, 1983, may display those marks until the aircraft is repainted or the marks are repainted, restored, or changed.

(c) *Width.* Characters must be two-thirds as wide as they are high, except the number “1”, which must be one-sixth as wide as it is high, and the letters “M” and “W” which may be as wide as they are high.

(d) *Thickness.* Characters must be formed by solid lines one-sixth as thick as the character is high.

(e) *Spacing.* The space between each character may not be less than one-fourth of the character width.

(f) If either one of the surfaces authorized for displaying required marks under § 45.25 is large enough for display of marks meeting the size requirements of this section and the other is not, full size marks shall be placed on the larger surface. If neither surface is large enough for full-size marks, marks as large as practicable shall be displayed on the larger of the two surfaces. If no surface authorized to be marked by § 45.27 is large enough for full-size marks, marks as large as practicable shall be placed on the largest of

the authorized surfaces. However, powered parachutes and weight-shift-control aircraft must display marks at least 3 inches high.

(g) *Uniformity.* The marks required by this part for fixed-wing aircraft must have the same height, width, thickness, and spacing on both sides of the aircraft.

(h) After March 7, 1988, each operator of an aircraft penetrating an ADIZ or DEWIZ shall display on that aircraft temporary or permanent nationality and registration marks at least 12 inches high.

[Doc. No. 2047, 29 FR 3223, Mar. 11, 1964, as amended by Amdt. 45-2, 31 FR 9863, July 21, 1966; Amdt. 45-9, 42 FR 41102, Aug. 15, 1977; Amdt. 45-13, 46 FR 48604, Oct. 1, 1981; Amdt. 45-15, 48 FR 11392, Mar. 17, 1983; Amdt. 45-17, 52 FR 34102, Sept. 9, 1987; 52 FR 36566, Sept. 30, 1987; Amdt. 45-24, 69 FR 44863, July 27, 2004; Amdt. No. 45-25, 72 FR 52469, Sept. 14, 2007]

§ 45.31 Marking of export aircraft.

A person who manufactures an aircraft in the United States for delivery outside thereof may display on that aircraft any marks required by the State of registry of the aircraft. However, no person may operate an aircraft so marked within the United States, except for test and demonstration flights for a limited period of time, or while in necessary transit to the purchaser.

§ 45.33 Sale of aircraft; removal of marks.

When an aircraft that is registered in the United States is sold, the holder of the Certificate of Aircraft Registration shall remove, before its delivery to the purchaser, all United States marks from the aircraft, unless the purchaser is—

- (a) A citizen of the United States;
- (b) An individual citizen of a foreign country who is lawfully admitted for permanent residence in the United States; or
- (c) When the aircraft is to be based and primarily used in the United States, a corporation (other than a corporation which is a citizen of the United States) lawfully organized and

doing business under the laws of the United States or any State thereof.

[Amdt. 45-11, 44 FR 61938, Oct. 29, 1979]

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SOURCE: Docket No. 7190, 31 FR 4495, Mar. 17, 1966, unless otherwise noted.